during the testing procedure. Thus, increased requirements are demanded for the contacting block. The contacting block serves external signal input to the contact areas of the drive circuit or to the contact areas of the data lines or gate lines or the corresponding shorting bars.

The above mentioned problems of the prior art are solved by inventive apparatus according to claims 1, 13, 20 and 28 as well as the inventive method according to claims 21 and 27.

According to an aspect of the invention, the object is solved by a drive electronics for driving an optoelectronic device with a matrix of picture elements. The drive electronics has a drive circuit with input terminals and output terminals. Further to this, the drive electronics includes a first arrangement of contact areas connected with the drive circuit and a second arrangement of contact areas connected with the drive circuit. Preferably, both arrangements of contact areas are connected with the input terminals of the drive circuit.

Furthermore, the first arrangement of contact areas has first contact areas and the second arrangement of contact areas has second contact areas. Preferably, the second contact areas of the second arrangement of contact areas are larger than the first contact areas of the first arrangement of contact areas.

The present invention allows to generate a test pattern which is sufficiently complex for the purpose of testing via the second arrangement of contact areas. For testing purposes, no arbitrary pictures have to be generated but patterns which are less complex compared to normal operation. Therefore, the number of contact areas for generating a test pattern can be reduced compared to the number of contact areas for generating an arbitrary picture during normal operation. This reduction of the number contact areas allows that the contact areas can be enlarged. Thus, it is possible to test display elements in a reliable, quicker and more effective fashion.

The drive electronics is preferably designed so that the number of input terminals of the drive circuit, by which the arrangement of contact areas for testing the drive circuit is

AMENDED CLAIMS (November 2004)

1. A drive electronics for driving an optoelectronic device with a matrix of picture elements, having

a drive circuit (102x), wherein

the drive circuit has input terminals (110) and output terminals (112);

a first arrangement of contact areas (104) connected with the input terminals of the drive circuit (102x); and

a second arrangement of contact areas (105) connected with the input terminals of the drive circuit (102x),

wherein the contact areas (105) of the second arrangement of contact areas are larger than the contact areas (104) of the first arrangement of contact areas.

2. The drive electronics according to any of the preceding claims, wherein:

the number of input terminals of the drive circuit (102x) by which the drive circuit is connected with the second arrangement of contact areas (105) is at most 5% of the number of output terminals of the drive circuit by which the drive circuit is connected with the control lines (103x) of the matrix of picture elements.

3. The drive electronics according to any of the preceding claims, wherein:

the first arrangement of contact areas (104) serves for picture generation during normal operation; and

the second arrangement of contact areas (105) serves for pattern generation during test mode.

4. The drive electronics according to any of the preceding claims, wherein:

the second arrangement of contact areas (105) is connected with the drive circuit (102x) via the first arrangement of contact areas (104).

5. The drive electronics according to claim 4, wherein:

the second arrangement of contact areas (105) is connected with the drive circuit (102x) via the first arrangement of contact areas (104) by means of switching elements or components.

6. The drive electronics according to claim 4, wherein:

the second arrangement of contact areas (105) is directly connected with the drive circuit (102x) via the first arrangement of contact areas (104).

7. The drive electronics according to any of claims 1 to 3, wherein:

the second arrangement of contact areas (105) is connected with the drive circuit (102x) via a test electronics (202x).

8. The drive electronics according to any of claims 1 to 3, wherein:

the second arrangement of contact areas (105) is directly connected with the drive circuit.

9. The drive electronics according to claim 8, wherein:

test circuits are integrated into the drive circuit.

10. The drive electronics according to any of the preceding claims, wherein:

the number of second pads (105b) of the second arrangement of contact areas (105) is at most 90% of the number of first pads (104b) of the first arrangement of contact areas (104), preferably at most 50%, more preferably at most 20%.

11. The drive electronics according to any of the preceding claims, wherein:

the second pads (105b) of the second arrangement of contact areas are larger than the first pads (104b) of the first arrangement of contact areas.

12. The drive electronics according to any of the preceding claims, wherein:

the second pads (105b) of the second arrangement of contact areas have a dimension of at least 100 μm, preferably a dimension of 0.5 mm, and more preferably a dimension of 2 mm.

13. An arrangement of test contact areas for providing signals for generating a test pattern to an optoelectronic device comprising a matrix of picture elements, having:

at least one pad (105b);

at least one connection (105a) of the at least on pad with a drive circuit (102x), which is provided with signals via an arrangement of operational contact areas (104) during normal operation

wherein the contact areas (105) of the second arrangement of contact areas are larger than the contact areas (104) of the first arrangement of contact areas.

14. The arrangement according to claim 13, wherein:

the drive circuit has input terminals (110) and output terminals (112), and wherein the at least one connection (105a) is connected with at least one of the input terminals (110).

15. The arrangement according to claim 13 or 14, wherein:

the at least one pad of the arrangement of contact areas has a dimension of at least 100 μm, preferably a dimension of 0.5 mm, and more preferably a dimension of 2 mm.

16. The arrangement according to any of claims 13 to 15, wherein:

the number of pads (105b) of the arrangement of test contact areas (105) is at most 90% of the number of pads (104b) of the arrangement of operational contact areas (104), preferably at most 50%, and more preferably at most 20%.

17. The arrangement according to any of claims 13 to 16, wherein:

the arrangement of test contact areas (105) is connected with the drive circuit (102x) via the arrangement of operational contact areas (104).

18. The arrangement according to any of claims 13 to 16, wherein:

the arrangement of test contact areas is connected with the drive circuit (102x) via a test electronics (202x).

19. The arrangement according to any of claims 13 to 16, wherein:

the arrangement of test contact areas is directly connected with the drive circuit (102x).

20. An optoelectronic device having

a matrix of picture elements (101);

a drive electronics according to any of claims 1 to 12.

21. A method for testing an optoelectronic device, comprising the steps of:

a) contact is made between an external control and an arrangement of test contact areas which are larger than operational contact areas;

b) an input terminal of a drive circuit is provided with input signals via the arrangement of test contact areas to generate a test pattern on a matrix of picture elements; and

c) the picture elements of the matrix of picture elements are tested.

22. The testing method according to claim 21, wherein

the input signals generate a periodic test pattern.

23. The testing method according to claim 21 or 22, wherein

the input signals generate a vertically, horizontally and diagonally periodic test pattern.

24. The testing method according to any of claims 21 to 23, wherein:

the picture elements are tested with a beam of charged particles or laser radiation.

25. The testing method according to any of claims 21 to 24, comprising the further step of:

a vacuum is generated in the vicinity of the optoelectronic device to be tested.

26. The testing method according to any of claims 21 to 25, wherein step c) comprises the following steps:

c1) the picture elements in a portion of the matrix of picture elements are tested;

c2) the optoelectronic device is shifted; and

c3) the picture elements in a further portion of the matrix of picture elements are tested.

27. A method for manufacturing a drive electronics of an optoelectronic device having a matrix of picture elements, comprising the steps:

a) a drive circuit is provided;

b) control lines of the matrix of picture elements are connected with output terminals of the drive circuit;

c) a first arrangement of contact areas is provided;

d) the first arrangement of contact areas is connected with input terminals of the drive circuit;

e) a second arrangement of contact areas is provided, said contact areas being larger than the contact areas of said first arrangement of contact areas; and

f) the second arrangement of contact areas is connected with input terminals of the drive circuit.

28. An optoelectronic device, which has been tested by a testing method according to any of claims 22 to 27 or by an apparatus according to any of claims 1 to 21.